

Amendments to the Claims:

The following listing of claims replaces all prior versions, and listings, of claims in the application:

Listing of Claims:

1-35. (canceled)

36. (previously presented) A method for soil management in pasture farming systems, comprising applying a nitrification inhibitor in solution form, fine particle suspension, or crystalline form to treat an entire area of grazed pasture soils, to reduce at least one of (1) NO_3^- -N leaching, (2) nitrous oxide emission; and (3) potassium, calcium or magnesium leaching, whereby pasture production in both animal urine patch areas and non-urine patch areas is increased.

37. (previously presented) A method according to Claim 36, wherein the nitrification inhibitor is applied in conjunction with either irrigation water by a spray vehicle, or by conventional method for application of agricultural chemicals.

38. (previously presented) A method according to Claim 36, wherein the nitrification inhibitor is applied in the autumn at a frequency and time that reduces NO_3^- -N leaching by about 76% for urine-N.

39. (previously presented) A method according to Claim 36, wherein the nitrification inhibitor is applied in the spring at a frequency and time that reduces NO_3^- -N leaching by about 42% for urine-N.

40. (previously presented) A method according to Claim 38, wherein the nitrification inhibitor is further applied in the spring at a frequency and time that reduces NO_3^- -N leaching by about 42% for urine-N, resulting in a annual average reduction of about 59%, which is equivalent to reducing NO_3^- -N leaching loss in a grazed pasture from about 118 to about 48 Kg N ha⁻¹ y⁻¹.

41. (previously presented) A method according to Claim 36, wherein the nitrification inhibitor is dicyandiamide (DCD), nitropyrin or 3,4-dimethylpyrazole phosphate (DMPP).

42. (previously presented) A method according to Claim 36, wherein the nitrification inhibitor is in the form of solution or fine particle suspension, whereby permeation of the inhibitor throughout a soil surface layer is enhanced, increasing the soil volume treated and slowing down the decomposition of the inhibitor.

43. (previously presented) A method according to Claim 36, wherein the nitrification inhibitor is applied multiple times to maintain and prolong the inhibition effect in the soil.

44. (previously presented) A method according to Claim 36, wherein the nitrification inhibitor is applied in crystalline form, which allows for its dissolution by rain or irrigation water.

45. (previously presented) A method according to Claim 36, wherein the NO_3^- -N concentration in a drainage water from the grazed dairy pasture soil is reduced from about 19.7 to about 7.7 mg N L⁻¹.

46. (previously presented) A method according to Claim 41, wherein a solution of DCD is applied to the grazed pasture at a frequency and timing to increase pasture production from the whole of grazed pasture by more than 15%.

47. (previously presented) A method according to Claim 46, wherein the application of DCD reduces total annual NO_3^- -N loss from about 488 to about 112 kg N ha⁻¹ y⁻¹.

48. (previously presented) A method according to Claim 41, wherein urea is applied at 200 kg N ha⁻¹ y⁻¹ throughout the pasture and the pasture is grazed by 3 cows per ha., wherein DCD is applied to the whole area of the grazed pasture soil, and wherein the average annual NO_3^- -N leaching loss is reduced from about 118 kg N ha⁻¹ y⁻¹ to about 46 kg N ha⁻¹ y⁻¹.

49. (previously presented) A method according to Claim 41, wherein pasture N off-take as a result of DCD application is increased by an equivalent of about 23% for autumn urine treatments, and about 9% for spring urine treatment, resulting in an annual average of about 16%.

50. (previously presented) A method according to Claim 41, wherein DCD application to the whole area of grazed pasture soil increases pasture yield from about 11.1 t to about 13.0 t ha⁻¹ y⁻¹.

51. (previously presented) A method according to Claim 41, wherein DCD is applied five times in a spring urine treatment, or nine times in an autumn urine treatment, or both.

52. (previously presented) A method according to Claim 41, wherein DCD is applied in a spring and an autumn application each year.

53. (previously presented) A method according to Claim 36, wherein application of the nitrification inhibitor reduces calcium leaching by about 50% (from about 213 to about 107 kg/ha/y), potassium leaching by about 65% (from about 48 to about 17 kg/ha/y), and magnesium leaching by about 52% (from about 17 to about 8 kg/ha/y).

54. (previously presented) A method according to Claim 36, wherein application of the nitrification inhibitor reduces nitrous oxide emission following urine application in the autumn from about 26.7 kg N₂O-N ha⁻¹ to about 7.2 kg N₂O-N ha⁻¹.

55. (previously presented) A method according to Claim 36, wherein application of the nitrification inhibitor reduces nitrous oxide emission following urine application in the spring from about 18.0 kg N₂O-N ha⁻¹ to about 4.5 kg N₂O-N ha⁻¹.

56-58. (canceled)